

WHAT IS CLAIMED IS:

1. A fusion polypeptide comprising a collagen-binding domain and an epithelial cell proliferation-modulating agent.

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2. The fusion polypeptide of claim 1, wherein the epithelial cell proliferation-modulating agent stimulates epithelial cell proliferation.

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3. The fusion polypeptide of claim 1, wherein the collagen-binding domain is a collagen-binding domain of von Willebrand factor.

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4. The fusion polypeptide of claim 3, wherein the collagen-binding domain of von Willebrand factor comprises the decapeptide WREPSFMALS (SEQ ID NO:1).

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5. The fusion protein of claim 1, wherein the epithelial cell proliferation-modulating agent is selected from the group consisting of a growth factor, a cytokine, an enzyme, an enzymatic inhibitor, and an antibody.

6. The fusion polypeptide of claim 5, wherein the growth factor is selected from the group consisting of epidermal growth factor (EGF), hepatocyte growth factor (HGF), tumor necrosis factor (TNF-alpha), platelet-derived endothelial cell growth factor (PD-ECGF), platelet-derived growth factor (PDGF), insulin-like growth factor (IGF), interleukin-8, growth hormone, angiopoietin, angiopoietin-1 and vascular endothelial growth factor (VEGF).
7. The fusion polypeptide of claim 6, wherein the growth factor is epidermal growth factor (EGF).
8. A nucleic acid sequence encoding a fusion polypeptide comprising a collagen-binding domain and an epithelial cell proliferation-modulating agent.
9. The nucleic acid sequence of claim 8, operably linked to a promoter.
10. An expression vector comprising the nucleic acid sequence of claim 8.

11. The expression vector of claim 10, wherein the expression vector is a retroviral vector.

12. A host cell comprising the nucleic acid sequence of claim 8.

13. A method of producing the fusion polypeptide comprising a collagen-binding domain and an epithelial cell proliferation-modulating agent, comprising growing the host cells of claim 12 under conditions that allow expression of the nucleic acid sequence and recovering the fusion polypeptide.

14. The method of claim 13, wherein the host is a prokaryotic cell.

15. The method of claim 13, wherein the host is a eukaryotic cell.

16. A method for modulating epithelial cell proliferation in a subject, comprising administering to the subject a fusion polypeptide comprising a collagen-binding domain linked to an epithelial cell proliferation-modulating agent.

17. The method of claim 16, wherein the subject is human.

18. The method of claim 16, wherein the subject has a disorder
5 selected from the group consisting of an ulcerative
lesion, an inflammatory lesion, a tumor, and arthritis.

19. The fusion polypeptide of claim 16, wherein the collagen-
binding domain is a collagen-binding domain of von
10 Willebrand factor.

20. The method of claim 19, wherein the collagen-binding
domain of von Willebrand factor comprises the decapeptide
WREPSFMALS (SEQ ID NO:1).

15 21. The method of claim 16, wherein the epithelial cell
proliferation-modulating agent stimulates epithelial cell
proliferation.

20 22. The method of claim 16, wherein the epithelial cell
proliferation-modulating agent is selected from the group
consisting of a growth factor, a cytokine, an enzyme, an
enzymatic inhibitor, and an antibody.

23. The method of claim 22, wherein the growth factor is selected from the group consisting of epidermal growth factor (EGF), hepatocyte growth factor (HGF), tumor
5 necrosis factor (TNF-alpha), platelet-derived endothelial cell growth factor (PD-ECGF), platelet-derived growth factor (PDGF), insulin-like growth factor (IGF), interleukin-8, growth hormone, angiopoietin, angiopoietin-1, and vascular endothelial growth factor (VEGF).

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24. The method of claim 23, wherein the growth factor is epidermal growth factor (EGF).

25. A method for modulating epithelial cell proliferation in a
15 subject, comprising administering to the subject a therapeutically effective amount of a nucleic acid sequence encoding a fusion polypeptide comprising a collagen-binding domain linked to an epithelial cell proliferation-modulating agent.

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26. The method of claim 25, wherein the subject is a human.

27. The method of claim 25, wherein the subject has a disorder selected from the group consisting of an ulcerative lesion, an inflammatory lesion, a tumor, and arthritis.

5 28. The fusion polypeptide of claim 25, wherein the collagen-binding domain is a collagen-binding domain of von Willebrand factor.

29. The method of claim 25, wherein the collagen-binding
10 domain of von Willebrand factor comprises the decapeptide WREPSFMALS (SEQ ID NO:1).

30. The method of claim 25, wherein the epithelial cell proliferation-modulating agent stimulates epithelial cell
15 proliferation.

31. The method of claim 25, wherein the epithelial cell proliferation-modulating agent is selected from the group consisting of a growth factor, a cytokine, an enzyme, an
20 enzymatic inhibitor, and an antibody.

32. The method of claim 31, wherein said cytokine is selected from the group consisting of epidermal growth factor (EGF), hepatocyte growth factor (HGF), tumor necrosis factor (TNF-alpha), platelet-derived endothelial cell growth factor (PD-ECGF), platelet-derived growth factor (PDGF), insulin-like growth factor (IGF), interleukin-8, growth hormone, angiopoietin, angiopoietin-1 and vascular endothelial growth factor (VEGF).

10 33. The method of claim 32, wherein the growth factor is epithelial growth factor (EGF).

34. A tissue graft, comprising isolated tissue comprising epithelial cells treated with a fusion polypeptide comprising a collagen-binding domain linked to an epithelial cell proliferation-modulating agent.

35. The tissue graft of claim 34, wherein the tissue is epithelial tissue.

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36. The tissue graft of claim 34, wherein the tissue is intestinal tissue.

37. The tissue graft of claim 34, wherein the tissue is an organ.

38. The tissue graft of claim 34, wherein the collagen-binding
5 domain is a collagen-binding domain of von Willebrand factor.

39. The tissue graft of claim 38, wherein the collagen-binding
domain of von Willebrand factor comprises the decapeptide
10 WREPSFMALS (SEQ ID NO:1).

40. The tissue graft of claim 37, wherein epithelial cell
modulating agent stimulates epithelial cell proliferation.

15 41. The tissue graft of claim 37, wherein the epithelial cell
proliferation-modulating agent is selected from the group
consisting of a growth factor, a cytokine, an enzyme, an
enzymatic inhibitor, and an antibody.

20 42. The tissue graft of claim 41, wherein the growth factor is
selected from the group consisting of epidermal growth
factor (EGF), hepatocyte growth factor (HGF), tumor
necrosis factor (TNF-alpha), platelet-derived endothelial

cell growth factor (PD-ECGF), platelet-derived growth factor (PDGF), insulin-like growth factor (IGF), interleukin-8, growth hormone, angiopoietin, angiopoietin-1 and vascular endothelial growth factor (VEGF).

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43. The tissue graft of claim 42, wherein the growth factor is epithelial growth factor (EGF).

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44. A method of preparing a tissue graft comprising contacting isolated tissue with an effective amount of a fusion polypeptide comprising a collagen-binding domain linked to an epithelial cell proliferation-modulating agent.

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45. The method of claim 44, wherein the contacting is *in vitro*.

46. The method of claim 44, wherein the contacting is *in vivo*.

47. The method of claim 44, wherein the tissue is a skin.

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48. The method of claim 44, wherein said tissue is an organ.

49. The method of claim 44, wherein the collagen-binding domain is a von Willebrand factor collagen-binding domain.

50. The method of claim 49, wherein the collagen-binding domain of von Willebrand factor comprises the decapeptide WREPSFMALS (SEQ ID NO:1).

51. The method of claim 44, wherein epithelial cell modulating agent is capable of stimulating endothelial cell proliferation.

52. The tissue graft of claim 37, wherein the epithelial cell proliferation-modulating agent is selected from the group consisting of a growth factor, a cytokine, an enzyme, an enzymatic inhibitor, and an antibody.

53. The method of claim 52, wherein the growth factor is selected from the group consisting of epidermal growth factor (EGF), hepatocyte growth factor (HGF), tumor necrosis factor (TNF-alpha), platelet-derived endothelial cell growth factor (PD-ECGF), platelet-derived growth factor (PDGF), insulin-like growth factor (IGF), interleukin-8, growth hormone, angiopoietin, angiopoietin-1 and vascular endothelial growth factor (VEGF).

54. The method of claim 53, wherein the growth factor is epithelial growth factor (EGF).

5 55. A method of activating a graft comprising contacting an isolated tissue with an effective amount of a nucleic acid sequence encoding a fusion polypeptide comprising a collagen-binding domain linked to an epithelial cell proliferation-modulating agent such that said nucleic acid
10 sequence is expressed in the tissue thereby activating the graft.

56. The method of claim 55, wherein the nucleic acid sequence is operably linked to a promoter.

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57. The method of claim 55, wherein the nucleic acid sequence is in an expression vector.

58. The method of claim 55, wherein the contacting is
20 *in vitro*.

59. The method of claim 55, wherein the contacting is *in vivo*.

60. The method of claim 55, wherein the tissue is epithelial tissue.

61. The method of claim 55, wherein the tissue is the lining
5 of the digestive tract.

62. The method of claim 55, wherein the collagen-binding
domain is a collagen-binding domain of von Willebrand
factor.

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63. The method of claim 62, wherein the collagen-binding
domain of von Willebrand factor comprises the decapeptide
WREPSFMALS (SEQ ID NO:1).

15 64. A pharmaceutical composition comprising a fusion
polypeptide comprising a collagen-binding domain linked to
an epithelial cell proliferation-modulating agent in a
pharmaceutically acceptable carrier.

20 65. A pharmaceutical composition comprising a nucleic acid
sequence encoding a fusion polypeptide comprising a
collagen-binding domain linked to epithelial cell
modulating agent in a pharmaceutically acceptable carrier.